

MSC Guidelines for Review of Fluid Power and Control Systems -- Small Passenger Vessel

Procedure Number: E1-12T

Revision Date: 03/10/03

References

- a. Title 46 CFR Part 54 Pressure vessels (Subchapter F)
 - b. Title 46 CFR Part 56 Piping systems and appurtenances (Subchapter F)
 - c. Title 46 CFR 58.30 Fluid Power and Control Systems (Subchapter F)
 - d. Title 46 CFR 119.715 - 119.730 Piping systems (Subchapter K)
 - e. Title 46 CFR 182.715 - 182.730 Piping systems (Subchapter T)
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Disclaimer

These guidelines were developed by the Marine Safety Center as an aid in the preparation and review of vessel plans and submissions. They were developed to supplement existing guidance. They are not intended to substitute or replace laws, regulations, or other official Coast Guard policy documents. The responsibility to demonstrate compliance with all applicable laws and regulations still rests with the plan submitter. The Coast Guard and the U. S. Department of Homeland Security expressly disclaim liability resulting from the use of this document.

Contact Information

If you have any questions or comments concerning this Guidance, please contact the Marine Safety Center by e-mail or phone. Please refer to Procedure Number: E1-12T.

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General Review Guidance

Applicable to All Vessels

- ❑ The design, construction, and testing of unfired pressure vessels, such as accumulators, shall meet the applicable requirements of 46 CFR 54.01-5 (c)(3), (c)(4), and (d) or the remaining requirements in 46 CFR Part 54. (Reference 46 CFR 58.30-25)
 - ❑ Fluid power cylinders may be required by 46 CFR 58.30(b) to be considered as pressure vessels. Fluid power cylinders shall have a bursting pressure of not less than 4 times the allowable working pressure. A certified burst report test report is acceptable. (Reference 46 CFR 58.30)
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Vessels Subject to Title 46 CFR Subchapter T

- ❑ Piping subject to more than 1,034 kPa (150 psig) in a non-vital system shall be designed, constructed, and inspected in accordance with ANSI B31.1 or other industry standard acceptable to the Commandant. (Reference 46 CFR 119.715 and 182.715)
- ❑ Flexible nonmetallic hose shall meet SAE J-1942 and may only be used at a pressure not to exceed the manufacturer's rating. Hose fittings shall comply with SAE J1475. Hose may not penetrate watertight decks or bulkheads. Flexible hose installed in lengths no more than 30 inches and subject to pressures of not more than 5 psig may meet the requirements of 46 CFR 182.730(e)(3)(v). Nonmetallic piping materials onboard subchapter K vessels shall comply with 46 CFR 56.60-25. (Reference 46 CFR 119.720 and 182.720)
- ❑ Nonferrous materials may only be used in accordance with 46 CFR 119.730 or 182.730, as applicable.
- ❑ Those systems not listed in 46 CFR 58.30-1(a) shall meet the requirements of 46 CFR 58.30-50(a)(1) through (a)(5):
 - ❑ The installed system must be tested in accordance with 46 CFR 58.30-35(c)(2).
 - ❑ The hydraulic fluid used in the system must comply with 46 CFR 58.30-35(c)(2).
- ❑ Where pipes are carried through bulkheads, decks, or tank tops, the integrity of the structure shall be maintained. (Reference 46 CFR 56.50-1)
- ❑ Numerous plans are returned for hoses not being identified as meeting SAE J-1492 with hose assemblies meeting SAE J-1475. Submitters should ensure that adequate information is provided to confirm compliance with these standards.
- ❑ Plans are also returned for not adequately providing information to confirm that the cylinders meet a 4:1 safety factor, that barrel elongation is a minimum of 12% and that the material used is accepted by ANSI B31.1. To alleviate these issues submitters should provide a mill certificate for all the materials used in the cylinder as well as burst test reports or calculations demonstrating a 4:1 safety factor (burst test/MAWP).

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- ❑ The ASTM specification of all metallic(ferrous/non-ferrous) tubing should be included with plan submittals. In no case is ASTM A-269 tubing accepted for steering systems. Some accepted tubing materials dependent upon operating pressure are: A-312, B-88, A-106, A-53ERW, A-53-S and A-268.
 - ❑ Valves (relief and isolation) must be intended for hydraulic service and rated for the MAWP of the system. Cut sheets should be included with plan submittals.
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